

**FINAL ANALYSIS AND FINDINGS REQUIRED BY HEALTH
AND SAFETY CODE SECTION 25150.6
NOVEMBER 28, 2001
DTSC RULEMAKING R-97-08
UNIVERSAL WASTE RULE**

Introduction: Rulemaking R-97-08, referred to as the proposed Universal Waste Rule (UWR), would permit handlers of certain hazardous wastes to manage that waste in a manner that differs from statutory requirements for hazardous waste. This document sets forth the preliminary analysis and findings required by Health and Safety Code section 25150.6 for regulations that vary from statutory requirements for hazardous wastes. The Department of Toxic Substances Control (referred to in this document as “the Department” and “DTSC”) accepted comments on this document during the 45 day public comment period for the draft UWR regulations. This document was updated to address any necessary changes, any comments received, and to conform with any changes made to the regulations after the public notice periods. The final document has been made available upon request and has been posted on the Department's Internet site at least 10 days prior to formal adoption of the regulation and transmittal to the Office of Administrative Law for final review as required by Health and Safety Code section 25150.6.

The Proposed Universal Waste Rule: The proposed Universal Waste Rule would establish permanent standards for specific widely produced hazardous wastes including hazardous waste batteries, hazardous waste lamps (fluorescent tubes, high intensity discharge lamps, etc), and hazardous waste thermostats (those with glass ampules containing mercury). These three waste streams are identified in the proposed regulations as “universal wastes.” The proposed State regulations are based on the corresponding standards established by the United States Environmental Protection Agency (U.S.EPA) for universal wastes. For further information about the contents, scope, and standards of the proposed Universal Waste Rule, please see the Initial Statement of Reasons for Rulemaking R-97-08.

The Universal Waste Rule addresses wastes produced by large segments of society, whereas most other hazardous wastes are produced by industrial generators. The universal wastes individually pose lower risks than most other hazardous wastes, but require proper management and ultimate disposition because of the large cumulative volumes of universal wastes produced in the State.

The Universal Waste Rule proposed in this rulemaking would allow certain persons to continue to manage their universal waste as non-hazardous waste for four years after the effective date of the regulations. These persons would be:

Households: This exemption would apply to only true households defined as private residences and excluding commercial and larger domiciles such as hotels, motels,

campgrounds, barracks, and ranger stations. To gain this exemption, the universal waste would be required to be disposed in a solid waste landfill and could not be disposed into the general environment.

Conditionally exempt small quantity universal waste generators: This exemption would apply to the smallest generators of both hazardous waste and universal waste - those generating less than 100 kg/month total RCRA hazardous waste plus universal waste. To gain this exemption, the universal waste would be required to be disposed in a solid waste landfill and could not be disposed into the general environment (disposed outside of landfills). The volume of fluorescent tubes disposed would be subject to further restrictions.

The Universal Waste Rule establishes special standards that allow simple and cost-effective management at every step of the process until the universal waste reaches its ultimate disposition, either hazardous waste disposal or recycling. The proposed regulations establish specific standards for universal waste that deviate from the following hazardous waste standards:

Storage time limits at transfer facilities: Health and Safety Code section 25123.3. This section defines a "storage facility". A transfer facility where hazardous waste is held in the course of transportation for less than 10 days in areas zoned industrial and less than six days in all other areas is not a storage facility.

Use of the manifest for transportation: Health and Safety Code section 25160. This section requires the use of a Uniform Hazardous Waste Manifest (manifest) for transporting hazardous wastes and establishes procedures for the use of the manifest.

Use of a registered hazardous waste transporter for transportation: Health and Safety Code section 25163. This section requires that all hazardous waste be transported by a Registered Hazardous Waste Transporter and establishes requirements for registered transporters.

Prohibition on disposal of hazardous waste at an unpermitted facility: Health and Safety Code section 25189.5. This section prohibits the disposal of any hazardous waste at an unauthorized facility and establishes penalties for this crime.

Hazardous waste facilities permit requirement for offsite intermediate accumulation points: Health and Safety Code section 25201. This section requires a hazardous waste facilities permit or other grant of authorization for, among other activities, offsite storage of hazardous waste. (Section 25201

establishes the permit requirement for, among other things, a storage facility; section 25123.3 defines a storage facility as, among other things, a facility which accepts offsite hazardous waste.)

This Document: This document follows the organization of Health and Safety Code section 25150.6. To assist the reader's understanding of the analysis and findings, each subsection of section 25150.6 is set forth in *italics* prior to the DTSC Evaluation, which includes analysis, explanation, and/or other information. Every subsection of the statute is addressed and the DTSC Evaluation identifies those subsections that are not applicable.

Incorporation by Reference: The proposed State rule is based on the corresponding federal rule. The rationale, facts, and figures behind the federal rule are primarily the information that DTSC relied upon in developing the proposed regulations. The four federal register notices that established the federal rules are incorporated by reference into this document in the same manner as they are in the Initial Statement of Reasons.

58 F.R. 8102 (February 11, 1993): Proposed UWR

59 F.R. 38288 (July 27, 1994): Proposed Lamps Rule

60 F.R. 25492 (May 11, 1995): Final UWR

64 F.R. 36466 (July 6, 1999): Final Rule - Hazardous Waste Lamps

Formal Section 25150.6 Analysis: As discussed above, the Department proposes to exempt universal wastes from five separate statutory sections: Health and Safety Code sections 25123.3, 25160, 25163, 25189.5, and 25201. The required analysis follows.

Section 25150.6. (a) Except as provided in subdivision (e), the department, by regulation, may exempt a hazardous waste management activity from one or more of the requirements of this chapter, if the department does all of the following:

(1) Prepares an analysis of the hazardous waste management activity to which the exemption will apply pursuant to subdivision (b). The department shall first prepare the analysis as a preliminary analysis and make it available to the public at the same time that the department gives notice, pursuant to Section 11346.4 of the Government Code, that it proposes to adopt a regulation exempting the hazardous waste management activity from one or more of the requirements of this chapter. The department shall include, in the notice, a reference that the department has prepared a preliminary analysis and a

statement concerning where a copy of the preliminary analysis can be obtained. The information in the preliminary analysis shall be updated and the department shall make the analysis available to the public as a final analysis not less than ten working days prior to the date that the regulation is adopted.

DTSC Evaluation: The preliminary analysis was made available on the DTSC Internet site. It was referenced, as required, in both the public notice and the Initial Statement of Reasons. The analysis was made available for public review and comment simultaneously with the proposed regulations, and the Initial Statement of Reasons.

This document provides the final analysis and findings pursuant to Health and Safety Code section 25150.6. It is being placed on the DTSC Internet site more than 10 days prior to formal adoption of this rule by DTSC. Additionally, a notice that the final analysis and findings document is available is being sent to all persons that commented on the rule or requested to be on the mailing list for this regulation.

(2) Demonstrates that one of the conclusions required by subdivision (c) is valid.

DTSC Evaluation: This document demonstrates that the conclusions found in paragraphs (3) and (4) of subdivision (c) are valid. See the discussion following text of those paragraphs below for the formal analysis.

(3) Imposes, as may be necessary, conditions and limitations on the exemption that ensure that the exempted activity will not pose a significant potential hazard to human health or safety or to the environment.

DTSC Evaluation: The conditions imposed to ensure the exemptions will not pose a significant potential hazard to human health, safety or the environment are the universal waste management standards being adopted, in part, under the authority of Health and Safety Code section 25150.6. That is, the project itself incorporates the conditions necessary to protect human health, safety, and the environment. The particular provisions are discussed in detail later in this document.

Section 25150.6 (b) Before the department gives notice of a proposal to adopt a regulation exempting a hazardous waste activity from one or more of the requirements of this chapter pursuant to subdivision (a), and before the department adopts the regulation, the department shall evaluate the hazardous waste management activity and prepare, as required by paragraph (1) of subdivision (a), an analysis that addresses all of the following aspects of the

activity, to the extent that the requirement or requirements from which the activity will be exempted can affect these aspects of the activity:

DTSC Evaluation: This document provides the evaluation and analysis. Specific portions follow after the text of each of the statutory subdivisions quoted below.

(1) The types of hazardous waste streams and the estimated amounts of hazardous waste that are managed as part of the activity and the hazards to human health or safety or to the environment posed by reasonably foreseeable mismanagement of those hazardous wastes and their hazardous constituents. The estimate of the amounts of hazardous waste that are managed as part of the activity shall be based upon information reasonably available to the department.

DTSC Evaluation: The specific waste streams, estimated amounts, and the hazards of their mismanagement are discussed below. Following the discussion of each of the three relevant waste streams is an additional detailed description of the hazards of mercury, which is found in hazardous waste lamps and thermostats.

A. Hazardous waste batteries, except automotive type spent lead acid storage batteries.

All hazardous waste batteries would be eligible for UW designation, except automotive-type lead acid batteries managed under California's lead-acid battery recycling regulations, sections 66266.80 and 66266.81, Division 4.5, Title 22, California Code of Regulations (22 CCR). In California, Assembly Bill (AB) 1530 (Chapter 575, statutes of 1996) made revisions to State statutes incorporating the provisions of the Federal Battery Management Act (FBMA) into California law. Specific battery types covered by the FBMA include sealed lead-acid batteries, rechargeable alkaline batteries, alkaline-manganese and zinc-carbon containing mercury batteries, button cell mercuric-oxide batteries, and other used rechargeable batteries. These batteries are already subject to the federal UW requirements pursuant to Health and Safety Code section 25219 et seq., and are not included in this analysis.

The only batteries made eligible for regulation as universal wastes in California by this rulemaking are those not covered by the FBMA. These include non-rechargeable alkaline zinc batteries, lithium ion batteries, silver cells, and carbon-zinc cells. Few other batteries exist that are not either alkaline batteries (addressed by this document) or covered by the FBMA (and thus outside the scope of this document.)

All batteries are relatively small containers of acidic or alkaline materials with both solid and dissolved metals. They are designed and manufactured to contain their contents

during shipment, sales, and use. While the contents can be very corrosive and toxic, they are individually packaged in very small (silver cells) to small (alkaline) packages - the battery itself.

The major hazards posed by batteries are caused by larger accumulated amounts. Rupture of the batteries can expose persons or environmental receptors to corrosive electrolytes and toxic metals. Rupture of significant amounts of batteries would take place only if they were accumulated for a very long time (and/or in large numbers) and then crushed or ground.

It is estimated that about 500,000,000 alkaline batteries are disposed in California each year (other batteries subject to this analysis are disposed in comparatively negligible amounts). This amount of batteries has significant potential to leach alkaline leachable constituents, such as arsenic, after disposal in landfills. When disposed in hazardous waste landfills, alkaline batteries will pose a much lesser hazard because the landfills are designed, sited, and operated to hold hazardous wastes. In addition, hazardous waste landfills must post post-closure bonds to maintain leachate collection, removal, and treatment systems after the closure of the landfill and must carry out these activities under a post-closure permit.

B. Hazardous Waste Thermostats.

Hazardous waste thermostats and the ampules that have been removed from them would be eligible for universal waste designation. Thermostats are generated primarily by heating, ventilation and air-conditioning (HVAC) contractors, wrecking and demolition firms, and firms using in-house maintenance workers. The number of HVAC contractors currently in California is approximately 6,658. This number is likely overestimated because plumbing contractors are also included under the same Standard Industrial Classification (SIC) code as HVAC contractors. Approximately 125 wrecking and demolition firms exist in California that also handle thermostats. Thermostats are also occasionally removed by homeowners and landlords of smaller businesses. Thermostats are found in most buildings; the older and simpler thermostats usually contain a few grams of mercury. Newer model electronic thermostats do not contain mercury and are not hazardous wastes.

The special hazards of mercury and the dangers of mismanagement are discussed below after the discussion of hazardous waste lamps because both the lamps and the thermostats are hazardous primarily due to mercury content.

C. Hazardous Waste Lamps.

The third type of universal waste designated by these regulations is hazardous waste

lamps. The most common hazardous waste lamps are fluorescent tubes of various sizes and configurations. Other high volume hazardous waste lamps include "street light" type lamps such as mercury vapor lamps and high pressure sodium lamps. The major hazard found in virtually all of the hazardous waste lamps is created by their mercury content. Mercury is easily vaporized and ionized; it is used in lamps to initiate a glow discharge actually generating the light. Lamps are glass containers that contain the mercury. Each lamp contains a relatively small amount of mercury; high degrees of hazard occur primarily when aggregated quantities of lamps are mismanaged. A discussion of the hazards of mercury in both thermostats and lamps is found after this discussion of lamps.

Some lamps (for instance low and high pressure sodium vapor lamps) exhibit the characteristic of reactivity due to their elemental sodium content. However, the amounts of sodium are small and the reactivity disappears after a few seconds of reaction with atmospheric water vapor.

The remaining hazard found in some common lamps is the leaded glass used to decrease the flux of X-rays formed by the glow discharge in some lamps. The glass contains enough lead to fail: (1) the federal toxicity characteristic (Title 40, CFR, section 261.24); (2) the State's Total Threshold Limit Concentration (TTLC); and (3) the Soluble Threshold Limit Concentration (STLC) criteria (Title 22, CCR, section 66261.24(a)(2)). The lead in glass lacks acute hazards, posing instead long term toxicity hazards through landfill leaching and groundwater contamination if the tubes are improperly disposed. Note that much of this glass is carefully formulated to very detailed specifications. Recycling would provide an inexpensive source of leaded glass for new lamps providing a greater incentive for recycling these lamps.

D. The Hazards of Mercury.

The capsules of mercury and the mercury contained in hazardous waste lamps such as fluorescent tubes, neon lamps, and high intensity discharge lamps, among others, pose the serious threats of both neurological and developmental toxicity. These toxicities occur when persons are exposed to mercury through direct contact, inhalation of vapors, and/or exposure to mercury released into the environment. Mercury in the environment can exist as elemental mercury or various compounds. Both elemental mercury and some mercury compounds are converted to methyl mercury by aquatic (benthic or bottom dwelling) organisms. The methyl mercury is quite water soluble and is bioaccumulated up the aquatic food chain. The Office of Environmental Health Hazard Assessment (OEHHA) has issued numerous fish consumption advisories due to the mercury content of the fish for a great many of California's waters, including San Francisco Bay. (See its Internet site at <http://www.oehha.ca.gov/fish.html> under "Advisories.")

Mercury is a very difficult element to dispose of safely and permanently. It forms few

stable (“refractory”) compounds that can permanently sequester it from the environment. Mercury is also very difficult and expensive to remove from wastewater and landfill leachates. Clearly, the best option for wastes containing mercury is to recycle and reuse the mercury, rather than to attempt to safely bury the problem.

Potential mismanagement of wastes containing mercury includes:

- “Dumpster” disposal: When lamps and thermostats that contain mercury are disposed in the solid waste stream, the glass containment is often broken during compacting by the trash hauler or spreading and covering in the landfill. It is highly unlikely that many fluorescent tubes remain intact in landfills. When broken, the mercury is released, contaminates the dumpster and/or the truck, and volatilizes into the air. Mercury released into the air ultimately adheres to dust and smoke particles and rains down on the landscape. When it rains, mercury contaminated “fall out” then enters the streams and rivers to bioaccumulate in the food chain.

In addition, at least one publicly operated treatment works (POTW) (Santa Rosa) has noted mercury limits being exceeded by discharges from dumpsters and trash trucks when they are washed between uses. It is highly likely that this is a direct result of mercury contaminating the equipment through disposed fluorescent tubes and thermometers. Through its volatility, mercury released from fluorescent tubes and other sources also poses a direct chronic inhalation threat to sanitation and landfill workers.

Note that thermostat capsules are much more robust than fluorescent tubes given their smaller size and greater glass thickness. However, if only one thermostat containing 2 grams of mercury breaks, it releases an amount of mercury equivalent to about 2,000 fluorescent tubes.

- Landfill disposal: Mercury that enters landfills poses a significant threat to groundwater resources. For older landfills with no leachate collection system and little monitoring, the direct threat to groundwater is very real. For new landfills with leachate collection systems and older landfills with monitoring programs, the mercury will not pose as much of a groundwater threat simply because, when detected, it must be remediated. However, this remediation poses a serious financial threat to landfill operators due to the difficult and expensive processes needed to effectively rid aqueous wastes of mercury.

A second route of exposure for landfilled mercury is release as methyl mercury gas. Recent studies of a Florida landfill, conducted by the Oak Ridge National Laboratory, incorporated in this rulemaking package as a study relied on, have shown releases of mercury from the landfill. The Oak Ridge studies showed that

mercury is converted to methyl and the more toxic di-methyl mercury by microorganisms in the landfill. It then is transported from the landfill as landfill gasses (primarily methane) are released.

(2) The complexity of the activity, and the amount and complexity of operator training, equipment installation and maintenance, and monitoring that are required to ensure that the activity is conducted in a manner that safely and effectively manages the particular hazardous waste stream.

DTSC Evaluation. Following is an evaluation and analysis of the universal waste management activity in general, followed by a detailed analysis for each universal waste stream.

A. Management of Universal Waste in General.

Effective management of universal wastes is neither difficult nor complex. Additionally, it requires minimal training and the training is simple. The proposed rules require that employees be made aware that these wastes are regulated hazardous wastes and may not be indiscriminately disposed. Training must be developed around location specific storage areas and containers chosen to shelter universal wastes from damage, especially the more fragile lamps. Beyond training in physical handling, packaging, and storage, training must address administrative concerns such as proper labeling and accumulation time limits.

B. Management of Universal Waste Batteries.

Management of universal waste batteries is simple and intrinsically safe with few rules that must be followed. Batteries that are leaking must be repackaged in safe containers or must be managed as hazardous wastes. Thus, only intact batteries, which completely contain their contents, and leaking batteries in impervious containers are within the scope of these rules. Batteries are very robust containers and can be handled on a human scale (as opposed to machinery scale management for drums and other larger packaging) without serious hazard of breakage. There are some batteries, such as lithium batteries, that pose additional hazards of reactivity and explosion, but only when fresh - the hazard disappears when the battery is discharged. Most significantly, fully charged (not discharged) lithium batteries can overheat and burst or even catch fire if short circuited. However, recognizing this problem, manufacturers began several years ago putting current-limiting resistors into the batteries to prevent high discharge rates leading to explosion.

For workers, the single most dangerous batteries are the automotive type lead acid storage batteries, which contain larger quantities of concentrated liquid sulfuric acid.

These batteries are not being designated as universal wastes and are outside the scope of both this rule and this discussion. (See the Initial and Final Statements of Reasons.)

Management of alkaline batteries is neither difficult nor dangerous. These batteries, when spent, retain their integrity and protect handlers from exposure. However, virtually all batteries can be expected to eventually leak due to the corrosive nature of their contents. Witness the corrosion all of us have found in old, seldom used flashlights. The standards of the rule ensure that most batteries will be used, discarded, and sent to appropriate final disposition before leaking.

C. Management of Universal Waste Lamps.

The primary objective in safely handling universal waste lamps is to never release the contents of the lamps - that is, don't break the glass. Effective and safe management revolves around plans to handle these relatively fragile wastes with minimal breakage. Containers for storage should be lightweight and protective. Few better accumulation containers exist than the cardboard sleeves in which most fluorescent tubes are sold and the boxes which held the sleeves. The regulations leave considerable room for persons managing lamps to determine their own best accumulation containers. Lamps that are broken must be immediately cleaned up and repackaged in airtight containers such as plastic bags or glass jars.

D. Management of Universal Waste Thermostats.

As with lamps, the primary object of thermostat management is to avoid breaking the glass. Thermostats themselves are managed by removing the mercury containing ampule, inserting it into a protective cardboard mailing tube, and then sending it by post or package delivery service to the recycler of thermostats or by turning the thermostat into a participating wholesaler of HVAC equipment. This directed management works very well for thermostats because the ampules are small and robust and because most thermostats are removed by professional HVAC contractors.

(3) The chemical or physical hazards that are associated with the activity and the degree to which those hazards are similar to, or differ from, the chemical or physical hazards that are associated with the production processes that are carried out in the facilities that produce the hazardous waste that is managed as part of the activity.

DTSC Evaluation. The chemical and physical hazards of universal wastes are generally unrelated to the hazards of the activities taking place in the facilities producing universal wastes. Universal wastes are infrastructure wastes common to virtually all buildings (lamps and thermostats) and a great many activities (batteries). Most hazardous wastes

pose greater immediate threats than universal wastes due to the higher quantities and the larger amounts found in any one container or tank. Unlike the industrial generators of other hazardous waste, many generators of universal wastes produce no other hazardous wastes and use few other hazardous materials. For instance, an office building that generates lamps, occasional thermostats, and batteries may very well not produce other types of hazardous waste.

(4) The types of accidents that might reasonably be foreseen to occur during the management of particular types of hazardous waste streams as part of the activity, the likely consequences of those accidents, and the actual reasonably available accident history associated with the activity.

The types of accidents expected from universal wastes are easily understood. The most serious type of accident is the breakage of the containment, thus releasing the contents to the environment. Due to the small amounts of hazardous material found in any one unit of universal waste, serious consequences can be expected only when larger quantities are broken. If larger quantities are broken, the hazardous contents pose all of the expected immediate acute hazards and chronic toxicity hazards. However, accidents such as transportation accidents which break, for instance, large volumes of fluorescent tubes, are generally responded to by emergency response personnel who promptly contain and clean up most of the released material.

Note that catastrophes such as huge earthquakes, which break many lamps and thermostats, will break them as easily in the lighting fixtures as in the universal waste storage areas.

The most common accidents with universal wastes will be simple breakage of single lamps or thermostats or small aggregated quantities. In these cases, the release will be small and, even when consequential, easily contained and managed as hazardous waste as required by the proposed regulatory standards. The limited size of expected releases will not pose a serious hazard unless poor management practices make such releases common. Even small accidents will require repackaging in more sophisticated containers which could be quite expensive for the handler; therefore, a powerful incentive for careful management is provided.

(5) The types of locations at which the activity may be carried out, an estimate of the number of these locations, and the types of hazards that may be posed by proximity to the land uses described in subdivision (b) of Section 25232. The estimate of the number of locations at which the activity may be carried out shall be based upon information reasonably available to the department.

DTSC Evaluation: High energy costs, environmental awareness and building codes combine to increase the use of energy efficient lighting containing mercury. Note that lighting industry data shows that, nationally, the additional energy needed to produce the same amount of light using incandescent bulbs rather than fluorescent tubes releases much more mercury than caused by improper disposal of all fluorescent tubes. The hazards of batteries and mercury containing lamps are found virtually everywhere including schools, day care centers, hospitals, even freeway interchanges. Paradoxically, the same energy conservation incentives, which encourage the use of lamps that contain mercury, are driving use of non-mercury electronic thermostats in place of older mercury containing thermostats.

DTSC estimates that at least one million businesses generate universal wastes. Universal waste lamps are found in most businesses and households, virtually all street lighting, and most other outdoor lighting. Almost all of the State's approximately 35 million residents generate batteries. A large subset of these batteries, is already incorporated into the State and federal Universal Waste Rule standards by State and federal statute (the FBMA). FBMA covered batteries are outside the scope of this rulemaking action. Thermostats containing mercury are found in most buildings in the State; however, the energy conservation superiority of modern electronic thermostats has driven their replacement in many locations.

Findings:

Section 25150.6 (c): The department shall not give notice proposing the adoption of, and the department may not adopt, a regulation pursuant to subdivision (a) unless it first demonstrates, using the information developed in the analysis prepared pursuant to subdivision (b), that one of the following is valid:

(1) The requirement from which the activity is exempted is not significant or important in either of the following:

(A) Preventing or mitigating potential hazards to human health or safety or to the environment posed by the activity.

DTSC Evaluation: The finding above is not applicable to the exemption from certain hazardous waste management requirements provided in the proposed Universal Waste Rule.

(B) Ensuring that the activity is conducted in compliance with other

applicable requirements of this chapter and the regulations adopted pursuant to this chapter.

DTSC Evaluation: The finding above is not applicable to the exemption from certain hazardous waste management requirements provided in the proposed Universal Waste Rule.

(2) A requirement is imposed and enforced by another public agency that provides protection of human health and safety and the environment that is as effective as, and equivalent to, the protection provided by the requirement, or requirements, from which the activity is being exempted.

DTSC Evaluation: The finding above is not applicable to the exemption from certain hazardous waste management requirements provided in the proposed Universal Waste Rule.

(3) Conditions or limitations imposed on the exemption will provide protection of human health and safety and the environment equivalent to the requirement, or requirements, from which the activity is exempted.

DTSC Evaluation: The finding above is applicable to the proposed Universal Waste Rule. By relaxing generation, accumulation, and transportation requirements for universal waste, but continuing to impose requirements for proper disposal or recycling, the proposed regulations will provide protection of human health and the environment that is equivalent or superior to the protection provided by current requirements. The proposed UWR is based on the corresponding federal rules. A detailed discussion of U.S. EPA's rationale for adopting the federal universal waste standards, which are much different from the general hazardous waste control regulations, is found in the four federal register notices incorporated by reference into this document. Following is a summary of the rationale.

A. General philosophy.

Universal wastes are different from other hazardous wastes in several key aspects that make the proposed regulatory system far superior to the traditional approach:

- Size: Universal wastes are generally small and easily hidden. Even the physically larger universal wastes such as fluorescent tubes can be easily broken and hidden in a paper bag. The U.S. EPA weighed the benefits of the standard hazardous waste control regulations against their cost, from the point of view of driving difficult to detect illegal disposal. U.S. EPA determined that a simpler and

less expensive system would generate higher compliance rates and less environmental damage.

- Hazard per unit: Although universal wastes contain very hazardous substances, each individual unit contains only a small quantity. The most serious hazards derive from situations where large quantities of the hazardous constituents are released such as at non-hazardous waste landfills. U.S. EPA determined that the major focus of the regulations should be to make them simple and inexpensive enough to divert disposal of large volumes of universal waste from inappropriate landfills. U.S. EPA found this approach to be superior to an attempt to absolutely minimize the potential for the release of hazardous constituents from each individual unit of universal waste. U.S. EPA determined that carefully controlling the packaging and handling of universal wastes during the generation, accumulation, and transportation phases of management would increase the complexity and expense of management to the point where illegal disposal would obviate the more important goal of proper ultimate disposition. In other words, risking occasional insignificantly small releases in handling through an inexpensive and easily followed process was deemed to pose much less of a real world hazard than inappropriate disposal of larger quantities.

B. Rationale for the Exemption from the Manifest Requirement:

U.S. EPA determined that the burden of using a manifest acted as a disincentive for the proper management of universal wastes. The disincentive comes from the regulatory requirements that accompany the use of a manifest, such as the requirements to obtain an ID number, comply with the waste code standards, and comply with detailed recordkeeping and retention requirements. In California, the following additional burdens accompany use of the manifest.

1. There is a fee attached to the use of a manifest.
2. The following requirements that accompany use of the manifest contradict other flexible standards of the Universal Waste Rule.
 - a. Use of the manifest requires obtaining an ID number, a requirement that is deliberately not applied to small quantity handlers of universal waste in the proposed rule.
 - b. Use of the manifest requires that a waste be shipped using a registered hazardous waste hauler, further increasing costs and decreasing the potential for proper management. The proposed rule does not require universal waste handlers to use registered haulers.

c. Use of the manifest requires that a waste be sent to a permitted facility, obviating the ability to send universal wastes to an unpermitted intermediate accumulation point. These accumulation points are one of the greatest incentives for proper accumulation and disposition of universal wastes.

In conclusion, the U.S. EPA has determined, and DTSC concurs, that the ability to exhaustively track universal waste shipments is offset by the incentives for proper ultimate management provided by the Universal Waste Rule.

C. Rationale for Exemption from the Registered Hazardous Waste Transporter Requirement.

State law requires use of a registered hazardous waste transporter. This program no longer requires periodic vehicle and container inspections because those standards were judged to be preempted by the U.S. Department of Transportation regulations. The major benefit of registration is a slightly higher level of insurance since the training and equipment required to obtain a hazardous materials endorsement on a drivers license are equivalent to those of the hazardous waste transporter registration program. Use of a registered hazardous waste transporter adds significant expense to transportation of universal wastes given the much smaller number of registered transporters compared with the number of common carriers licensed to transport hazardous materials. DTSC has determined that the hazardous waste transporter requirement adds sufficient extra expense to the transportation of universal wastes to provide a disincentive for proper management. This situation harms the environment when compared to the proposed regulations.

D. Rationale for Exemption from the Permit Requirement for Offsite Accumulation Points.

The proposed rules allow offsite accumulation by small and large quantity handlers of universal waste without a hazardous waste facilities permit. Thus, the public review and comment, CEQA process, and the restrictive regulations associated with hazardous waste permits do not apply to offsite accumulation and storage of universal wastes. (The full permit program continues to apply to universal waste disposal and recycling facilities in California). This exemption allows the universal waste expedited collection and management program established by U.S. EPA.

DTSC concurs with the judgement of U.S. EPA in this matter. The ability to accumulate and store universal waste without a permit will encourage: (1) firms to take back spent universal wastes when selling new products which will, when spent, become universal wastes; (2) household collection facilities to accept universal wastes for proper disposition; and (3) third party firms to cheaply and conveniently collect universal wastes

for transshipment and ultimate disposition. These accumulation activities are an essential component in the system to move universal wastes from generator locations to the permitted disposal and recycling sites. DTSC has determined that, absent this provision, far greater amounts of universal waste would be illegally disposed rather than sent directly to proper disposal and recycling facilities.

E. Rationale for temporary exemption from the requirement that hazardous waste be disposed in authorized facilities.

DTSC is proposing four year exemptions from hazardous waste disposal for universal wastes produced by both households and conditionally exempt small quantity universal waste generators. These exemptions are proposed to allow sufficient time for household hazardous waste collection facilities to gain funding and develop management plans for accepting universal waste from both households and “small quantity commercial sources”, and for other management alternatives such as takeback programs and third party universal waste collection and transshipment firms to develop. DTSC has determined that very small generators of universal waste would find the disposal options practiced by larger generators such as direct shipment to recyclers and hazardous waste disposal sites very expensive and impractical. The expense and impracticality of hazardous waste disposal would drive the smaller generators to practice both solid waste (trash) disposal of the easily hidden universal wastes and more environmentally harmful disposal to the general environment in ditches, fields, and other inappropriate locations. The current expense of disposing of used tires has resulted in the appearance of small tire piles all over the California countryside. Similar disposal of lamps, thermostats, and batteries in inappropriate locations would lead to the release of their hazardous constituents into surface and ground water and direct exposure to children and wildlife.

DTSC is committed to working with the California Integrated Waste Management Board, the California Energy Commission, the State Water Resources Control Board, the Household Hazardous Waste Information Exchange, and any other interested stakeholders to ensure that multiple simple and inexpensive options exist for householders and small generators after the sunset of these exemptions in four years. The existence of such simple options will greatly increase compliance with the requirement for hazardous waste disposal or recycling of all universal waste. It is the intent of DTSC to ensure that households and small generators will find sufficient convenient and inexpensive options for disposal when they become subject to the universal waste management standards in four years to prevent habitual illegal disposal from becoming their accepted and long-term practice.

Any continued impact from disposal to non-hazardous landfills during the effective period of the exemptions is further reduced by the phased-in reduction in exempted quantities. The exemptions will remain at a level similar to that found in the emergency regulations

and the federal Universal Waste Rule for only two years. These two years will be used to educate smaller businesses about their duties under the Universal Waste Rule and to notify all business that the exempted quantities will drop dramatically in two years. Two years and one day after the final regulations become effective, the exempted amounts for the small quantity exemption will drop by about a factor of ten to only 30 fluorescent tubes per month, 20 pounds of batteries, and no thermostats. Disposal of hazardous waste thermostats by small generators to non-hazardous waste facilities will be forbidden during the last two years of the exemption because there is simple and cost free recycling available through the Thermostat Recycling Corporation of America and because each thermostat contains as much mercury as at least two thousand fluorescent tubes.

(4) Conditions or limitations imposed on the exemption accomplish the same regulatory purpose as the requirement, or requirements, from which the activity is being exempted but at less cost or greater administrative convenience and without increasing potential risks to human health or safety or to the environment.

DTSC Evaluation: The finding above is applicable to the proposed UWR. The proposed UWR is based on the corresponding federal rule. A detailed discussion of the U.S. EPA's rationale for adopting the federal universal waste standards, which are much different from the general hazardous waste control regulations, is found in the four federal register notices incorporated by reference in this document. Following is a summary of the rationale.

A. General philosophy

The streamlined, more flexible, standards of the proposed Universal Waste Rule clearly impose a much smaller financial burden on generators and other handlers of universal waste than the burden that is otherwise imposed by compliance with California's hazardous waste control law. The proposed standards not only allow cheaper management, they also dispense with much of the record keeping, permitting, and other administrative requirements of the general hazardous waste control law, including the three statutory requirements that are waived in the proposed regulations. In waiving these standards, U.S. EPA determined and DTSC concurs, that the costs and inconvenience of meeting these standards would simply drive illegal disposal of these easily hidden wastes. DTSC is also waiving the non-RCRA requirement for use of a registered transporter. In other words, both U.S. EPA and DTSC believe that the flexible standards of the Universal Waste Rule will not only be equally protective during the generation, accumulation, and shipment of universal wastes, but will also move a much larger fraction of the universal waste streams to proper ultimate disposition.

B. Rational for Exemption from the Manifest Requirement.

By exempting universal waste handlers from the requirement to use a manifest during transportation, the Universal Waste Rule also (as discussed above) removes the requirements on handlers to obtain ID numbers, use registered transporters, and move the waste only to permitted facilities (not to unpermitted intermediate accumulation points). By removing these financial burdens (that are requirements which accompany the use of a manifest in addition to being separately applied to generators of hazardous waste) and the cost and inconvenience of manifest record retention, generators will be much more likely to send universal wastes down the universal waste management chain to proper ultimate disposition rather than hiding them in non-hazardous solid waste and sending them to inappropriate disposal sites. Ultimately, the risks are greatly reduced for all handlers and neighbors by removing the incentive to, for instance, break fluorescent tubes into paper bags, exposing workers to mercury fumes and releasing the mercury into the environment.

C. Exemption from the registered hazardous waste transporter requirement.

As discussed above, there is little significant direct environmental protection provided by the registered hazardous waste transporter requirement for handlers of universal waste. The added costs and inconvenience of using a registered transporter would provide a disincentive for proper management. Hiding universal wastes in the solid waste system fails to reduce the hazard to employees of the firm generating the universal waste, workers at solid waste facilities, and the general public near the released universal waste constituents.

D. Exemption from the permit requirement for offsite accumulation points.

This waiver does more than any single provision of the Universal Waste Rule to facilitate and promote simple and cheap alternatives for proper disposition of universal wastes. As discussed in several places above, providing cheap and simple collection (and ultimate disposal) options removes the considerable incentive for illegal disposal of these easily hidden wastes. The cost of obtaining and maintaining hazardous waste facility permits would increase the costs of operating intermediate accumulation points and the costs of using their services. These added costs would be expected to minimize the number of such facilities operating and thus minimize the options available for collection and disposal of universal wastes. All of these factors would increase the incentives for illegal disposal to non-hazardous landfills and other uncontrolled locations and increase risks to public health and the environment through continued disposal to non-hazardous landfills and to the general environment.

E. Rationale for temporary exemption from the requirement that hazardous waste be disposed in authorized facilities.

These exemptions allow a phased implementation of the Universal Waste Rule for the smallest and most numerous universal waste generators. A phased approach will prove more effective because the increase in the number of generators regulated will be more closely matched to the increase in capacity and options for simple and efficient collection and transshipment of universal wastes. While the allowance to continue to place large quantities of universal waste in non-hazardous landfills may seem on its face to be environmentally inappropriate, it will provide increased environmental protection over the unsafe management practices that would result from requiring immediate compliance with hazardous waste management and disposal or recycling requirements before a simple and inexpensive infrastructure is established to collect and recycle or properly dispose of the universal wastes. DTSC expects that imposition of the more stringent hazardous waste disposal requirement for all generators prior to the development of simple and cheap collection and transshipment options would have the effect of greatly increasing uncontrolled disposal of universal wastes to the general environment. Complexity and inconvenience coupled with significant costs will drive many households and small quantity generators to very inexpensive disposal in ditches, fields, sloughs, and other inappropriate places. While solid waste landfills are inferior to hazardous waste landfills and destination facilities, they are clearly superior to uncontrolled environmental disposal. Solid waste landfills limit access by children and wildlife. They must monitor groundwater and will ultimately be required to remediate any leakage of hazardous constituents while uncontrolled disposal sites offer no protections. Identification and prosecution of illegal disposers of tires and buckets of waste oil in the countryside has proven sufficiently difficult and resource intensive to provide little disincentive for such disposal even though tires and, especially oil, can be easily and relatively cheaply disposed. While the ultimate development and implementation of simple and cheap disposal alternatives will not prevent all uncontrolled disposal of universal wastes, it will allow and foster compliance by most households and small businesses. Immediate application of the hazardous waste disposal requirement would likely not only drive immediate increases in uncontrolled disposal, but also long term habitual uncontrolled disposal.

Necessity Requirement:

Section 25150.6 (d) A regulation adopted pursuant to this section shall not be deemed to meet the standard of necessity, pursuant to Section 11349.1 of the Government Code, unless the department has complied with subdivisions (b) and (c).

DTSC Evaluation: As indicated above, this document represents compliance with those provisions.

Compliance with Federal Act:

Section 25150.6 (e) The department shall not exempt a hazardous waste management activity from a requirement of this chapter or the regulations adopted by the department if the requirement is also a requirement for that activity under the federal act.

DTSC Evaluation: The proposed State regulatory standards are virtually identical to the corresponding federal standards in almost all provisions. When the actual regulatory standards vary, for instance in the recycling requirement for lamps, these standards are more stringent and protective than the federal standards. The major deviation from the federal standards is the scope of the regulated community. The household and small quantity exemptions proposed in the Universal Waste Rule are both equivalent to, but much narrower in scope, than the corresponding federal exemptions. These proposed standards will both initially and ultimately regulate a much larger universe of entities than the corresponding federal rules thereby giving the State a much higher degree of environmental protection than provided by the federal rule. Thus, the regulations, as proposed, meet the standards of Health and Safety Code sections 25159 and 25159.5 for regulations to obtain and maintain RCRA authorization.

Sunset of Authority:

Section 25150.6 (f) The authority of the department to adopt regulations pursuant to this section shall remain in effect only until January 1, 2002, unless a later enacted statute, which is enacted before January 1, 2002, deletes or extends that date. This subdivision does not invalidate any regulation adopted pursuant to this section prior to the expiration of the department's authority.

DTSC Evaluation: These regulations are proposed for adoption before January 1, 2002. If the regulations fail to be adopted before that date, they will be adopted pursuant to the authority of Senate Bill 470 of 2001 (Chapter 605), Health and Safety Code section 25150.6.

Conclusion: Based on the above analysis, DTSC concludes that the proposed regulations meet the criteria of Health and Safety Code section 25150.6 for variance from existing statutory requirements and will provide protection of human health and the environment.

COMMENTS RECEIVED AND RESPONSE TO COMMENTS:

Commenter D, Larry Sweetser, Sweetser and Associates

D1: "1.A. Hazardous waste batteries, except automotive type spent lead acid storage

batteries (page 6, paragraph 5) - The extent of assessment regarding the hazard of batteries in solid waste landfills is inflated. Concentrated exposures to the ingredients in alkaline batteries can result in harm to people and the environment. The idea of 500,000,000 batteries disposed in landfills seems like a significant hazard. Assuming that the number is accurate enough, the amount of batteries is insignificant in comparison to the amount of solid waste disposed of in solid waste landfills. About 66 million tons of solid waste was disposed of 2000 (sic) at 184 California landfills and other out-of-state landfills in 2000. Assuming 0.8 ounces per battery (AA size), five hundred million batteries would equal about 13 thousand tons of batteries per year or about 0.02 percent of the solid waste stream. In addition, that assumes that all of the batteries would leak the entire contents and that the amount of alkaline and metal waste would reach the environment or people. That assumption is also inaccurate since an item as small as a battery would likely not rupture in a collection or disposal setting and disintegration of the casing may never happen given the tomb like nature of many landfills.

In addition, solid waste landfills are required to meet closure and post-closure requirement (sic)

Therefore, there is sufficient evidence that hazardous waste batteries are not a significant problem to solid waste landfills. This clarification does not impede the approval of the Universal Waste Rule but serves to reflect actual conditions of these wastes in landfills.”

Response: First, for waste to be allowed to go to nonhazardous waste landfills, the waste must be nonhazardous (or receive authorization for nonhazardous waste landfill disposal.) Batteries are clearly hazardous waste under pre-existing criteria. This rulemaking does not propose changes to the hazardous waste identification criteria; thus, designating batteries as nonhazardous is outside the scope of this rulemaking. Likewise, this rulemaking is not intended to explore whether permanent disposal to nonhazardous landfills is appropriate for batteries.

However, there is another factor that will allow significant amounts of batteries (and other universal wastes) to be disposed as nonhazardous waste for a limited period of time. The household and conditionally exempt small quantity universal waste generator exemptions will allow disposal of universal waste to nonhazardous landfills from specified sources during a transition time while infrastructure develops to manage wastes from these smaller sources. This exemption is allowed because DTSC has determined that immediate prohibition of nonhazardous landfill disposal for universal wastes prior to development of a robust, simple, and inexpensive disposal/recycling infrastructure will actually drive more harmful disposal to the general environment in places such as parking lots, irrigation canals, and other inappropriate places. Disposal in such inappropriate places creates enhanced risks for persons coming into contact with these wastes, wildlife, and the general environment. Note that these exemptions do apply to batteries.

DTSC also takes exception to the statement that batteries are encased in leakproof cases and may never leak in landfills. Most persons have opened an older flashlight that is corroded beyond usefulness because batteries do leak and release very corrosive contents.

It may be true that disposal of batteries in nonhazardous waste landfills is environmentally safe and appropriate; however, this rulemaking is not intended to make such waste classification decisions. As discussed above, this rulemaking is not intended to determine whether permanent allowance to dispose batteries (or other universal wastes) to nonhazardous waste facilities is appropriate. This rulemaking is intended to adopt simpler standards for managing these specified hazardous wastes that will increase the legally required disposal or recycling at hazardous waste facilities.

D2: "1.D. The hazards of mercury (page 8, paragraph 3) - The dumpster disposal bullet item should indicate that "glass containment ~~is~~ may be broken during compaction. Although breakage is likely for the tubes, it is not a certainty for all tubes and thermostats. The next sentence regarding the mercury from broken tubes volatilizing provides substantiation for solid waste facility operators to not reject loads containing broken tubes. Operators can notify customers that tubes should be handled properly. Repeat customers may be referred to the appropriate regulatory agency for investigation."

Response: DTSC agrees that there is no certainty that 100% of fluorescent tubes and thermostats will be broken during disposal, compaction, spreading of waste at the landfill, and spreading and compaction of daily cover. The amount of breakage will be significant (probably approaching 100% for tubes) and the lack of 100% breakage does not affect the findings of this document. The text of the preliminary analysis is changed in accordance with this comment and DTSC's understanding of solid waste operations.

Note that loads with broken tubes need not be rejected. Mixtures of characteristic hazardous wastes (title 22, California Code of Regulations (CCR), chapter 11, article 3) and other materials are identified as hazardous wastes only if the mixture continues to exhibit a characteristic of a hazardous waste (title 22, CCR, section 66261.3.) Only those loads with very large amounts of tubes would meet this criterion and require rejection.

D3: "2.C. Management of Universal Waste Lamps (Page 10, first paragraph) - Prevention of glass breakage is the most desirable option. In addition to the containers listed, the original package for the tubes can be a low cost option for safe storage and transportation."

Response: DTSC concurs that the original packaging can, in some cases, provide a low cost and protective option for safe storage and shipment. Simply removing a tube from a lamp and placing it into the sleeve in which the new tube was packaged, then into the

original box after labeling will provide a high quality alternative to custom packaging. This is obviously not the case, however, for some consumer tubes shipped in shrink wrapper packaging. The text is altered in response to this comment.

Commenter R: Ray Balfour, Dry Batteries Section, National Electrical Manufacturers Association.

R5: Preliminary analysis and findings: Contradictory language. Addressing batteries covered by Act and not covered by the Act.

(R5 continued) Preliminary Analysis: Hazards are caused by accumulation of larger amounts of batteries. However, they are not crushed and ground.

Response: Mr. Balfour is correct that larger amounts of batteries are not normally crushed or ground (outside of recycling facilities). However, crushing or grinding is not necessary to release the contents of batteries. Virtually all batteries leak over time. This fact is evident to anyone who has opened an older flashlight and found the interior corroded beyond usefulness by leaking battery electrolyte. Simple and common leakage will ultimately release hazardous contents from batteries; crushing and grinding is not necessary for batteries to pose a hazard. In fact, the hazards of larger quantities alluded to by Mr. Balfour derives from the leakage expected from some of the batteries in any large accumulation. Such leakage is why the Universal Waste Rule allows only one year for accumulation at any handler's facility and why the rule requires repackaging of leaking batteries in impervious packaging (for instance, a common self-sealing plastic bag).